

SONY International (Europe) GmbH

„Adaptive subcarrier loading“

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Claims:

1. Wireless multicarrier transmission method,  
wherein subcarriers of the multicarrier transmission are modulated (6),  
10 characterized in that  
the modulation scheme on each subcarrier is selected (8) depending on to the channel  
transfer function (9) on the subcarrier.
2. Method according to claim 1,  
15 characterized in that  
for the selection of the modulation schemes loading tables (13) are calculated (8) for the  
subcarriers, wherein the loading tables (13) have respectively one entry for each  
subcarrier.
- 20 3. Method according to claim 1 or 2,  
characterized in that  
the modulation scheme of subcarriers having a high power level is increased, whereas  
the modulation scheme of subcarriers having a poor power level is decreased departing  
from a default modulation scheme.
- 25 4. Method according to anyone of the preceding claims,  
characterized in that  
the modulation schemes of the subcarriers are adapted such that the total number of  
coded bits per symbol is constant.
- 30 5. Method according to anyone of the preceding claims,  
characterized in that

along with the adaptation of the modulation schemes the transmission power of the subcarriers are adapted such that the total transmission power of all subcarriers remains unchanged.

5 6. Method according to claim 5,

characterized in that

the transmission power of subcarriers having a higher modulation scheme is enhanced to compensate for subcarriers which are not modulated at all due to the adaptation of the modulation scheme.

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7. Method according to anyone of the preceding claims,

characterized in that

an adaptive loading information reflecting the adaptation of the modulation scheme of the subcarriers is exchanged between a transmitter (11) and a receiver (10).

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8. Method according to claim 7,

characterized in that

- the receiver (11) calculates a suitable loading based on received signals,
- the receiver (11) sends the adaptive loading information in a signalling field and uses

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the calculated adaptive loading in the data field of a transmitted data train.

9. Method according to anyone of the preceding claims,

characterized in that

a plurality of subcarriers is bundled into groups and the same modulation scheme is applied for all subcarriers belonging to the same group.

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10. Method according to claim 9,

characterized in that

a plurality of adjacent subcarriers is bundled into one group.

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11. Computer software program product,

characterized in that

it implements a method according to anyone of the preceding claims when run on a computing device of a wireless transmitting device.

12. Data train for a wireless multicarrier transmission having subcarriers which  
5 are adaptively modulated,  
wherein the data train comprises at least one traffic data field (LCH) as well as at least one adaptive modulation information field (SCH) reflecting the modulation scheme of the subcarriers used for the traffic data field (LCH).

10 13. Data train according to claim 12,  
characterized in that  
a plurality of subcarriers having the same modulation scheme is bundled into a group and the adaptive modulation information field (SCH) contains information regarding the modulation scheme respectively used for one group of subcarriers.

15 14. Wireless multicarrier transmission device,  
comprising a modulator (6) for modulating subcarriers of the multicarrier transmission,  
characterized by  
an adaptive loading calculation unit (8) selecting the modulation scheme on each  
20 subcarrier depending on supplied channel transfer function information (9) on the subcarrier.

15. Device according to claim 14,  
characterized in that  
25 the adaptive loading calculation unit (8) calculates adaptive loading tables (13) for the subcarriers, wherein the loading tables (13) have respectively one entry for each subcarrier.

16. Device according to anyone of claims 14 or 15,  
30 characterized in that  
the adaptive loading calculation unit (8) bundles respectively a plurality of subcarriers into groups and applies the same modulation scheme on all subcarriers belonging to the same group.

17. Device according to claim 16,  
characterized in that  
the adaptive loading calculation unit (8) bundles a plurality of adjacent subcarriers into  
5 one group.

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